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Tillage in 2001: Fall strip-tillage

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Tillage in 2001: Fall strip-tillage

Abstract

Every tillage practice has distinct advantages and disadvantages, requires specific equipment, and requires that you learn how to successfully implement the practice in your operation. In this article, we discuss the merits of fall strip-tillage and present some of the facts you need to consider to implement fall strip-tillage.

Keywords

Agronomy, Agricultural and Biosystems Engineering

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences | Bioresource and Agricultural Engineering



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What is fall strip-tillage?

Many Iowa producers have experienced slightly lower yields with no-till, especially with corn, compared with full-width or ridge-tillage systems or conventional tillage. This yield reduction may be attributed to slow seed germination due to cool soil temperatures and wetter seedbeds during the planting season. Many producers experimented with planter attachments that moved no-till residue away from the row during planting to combat slow germination caused by cool and residue-covered soils.

Fall strip-tillage requires tilling of only one-third of the soil in strips 6 to 8 inches wide by using one of the following: modified anhydrous ammonia applicator knives, a rototiller, in-row chisel, row cleaners, double-discs, or other implements. With anhydrous ammonia applicator knives, consider moving the knife positions out of the wheel track area, so planting does not occur in a wheel track. Other fall strip-tillage tools include cultivator sweeps and other angled blades that lift soil. The tillage zone provides relative positions for seeds, fertilizers, or anhydrous ammonia.

Fall strip-tillage also offers solutions to some of the complications of no-till such as heavy residue, poorly drained soils, very early planting, and an uneven soil surface at planting. In fall strip-tillage systems, producers open a zone of soil within the crop residue with a minimal-impact tillage operation where next year's crop row will be planted. The distinction is that the strip is tilled in the fall instead of in the spring in front of the planter.

Advantages and disadvantages

Using a fall strip-tillage system has many benefits in common with no-till, including the contribution of a protective layer of crop residue on the soil surface and conservation of soil moisture. It also reduces soil erosion because only one-third of the soil surface is disturbed, and preserves the majority of crop residue on the soil surface.

Strip-Tillage Management Time Line

Fall 2000

- Harvest
- Fall strip-tillage in corn residue and very heavy bean residue, with possible deep injection of fertilizer

Fall strip-tillage also positions producers to take advantage of such benefits in the fall after harvest. Because soils are usually drier in the fall than in the spring, fall strip-tillage better prepares the soil, minimizes compaction, prepares a more uniform seedbed, improves seed-to-soil contact, and dries and warms the soil ahead of spring planting rather than as a result of it. These soil conditions create a healthy soil environment for vigorous plant growth and development.

Fall strip-tillage has its limitations as well. Some soils may remain wet under the heavy residue, and tillage tools used to prepare a strip for seed placement tend to compact the soil and form clods when the soil dries. Wet soils also cling to the depth gauge wheels on the planter, inhibiting uniform seed depth. And for producers who plant in heavy cover crops or sod, rolling strip tillage attachments may not be able to effectively penetrate the root masses. Over winter, residues removed in the strip tillage pass can blow over the area that was tilled, suppressing the benefits of warming and drying.

Maintaining adequate residue cover

Fall strip-tillage may not be necessary following beans: measure your crop residues, and don't use fall strip-tillage if you have less than 70 percent bean residue. As with any conservation tillage system, leave the soil slightly ridged so water is directed into the residue-covered middles, and consider planting on contour where possible for even greater conservation effect.

Summary

Fall strip-tillage isn't the best tillage system for everyone. But if your soils are wet, or you've had germination problems due to cold, wet weather, look into using a fall strip-tillage system.



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Winter 2000

- Leave remaining crop residue on the field's surface

Spring 2001

- Plant in open fall strip-tillage zone

Summer 2001

- Normal no-till weed control

Fall 2001

- Harvest
- Fall strip-tillage in corn residue and very heavy bean residue, with possible deep injection of fertilizer

Winter 2001

- Leave remaining crop residue on the field's surface

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